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*NFRC Accredited Computer Modeling & Simulation Laboratory*

## **NFRC THERMAL SIMULATION REPORT**

U-Factor (ANSI/NFRC 100-2017), CR (NFRC 500-2017)  
SHGC and VT (ANSI/NFRC 200-2017)

**Fenestration Product:** **Aluminum/Vinyl Composite Sliding Glass Door**

**Report#:** SIM18D-006

**Series#:** **S-6800/6850 – multi slide**

**Submitted To:** Rey Nea

**Manufacturer:** **GREEN WORLD WINDOWS**

**Address:** 4195 Chino Hills Parkway, Ste. 508, Chino Hills, CA 91709

**Phone#:** (909) 923-8618

**Baseline Product:** [2000 mm (±25mm)] [79"(±1")] X [2000 mm (±25mm)] [79"(±1")]

Product # 011: SB70 / ARGON / CLEAR\_3mm \_ A8-D spacer: [U = 0.35 Btu/hr\*ft<sup>2</sup>\*F]

Per ANSI/NFRC 100-2017: Sec. 4.2.6: The individual product selected as the baseline product shall have a simulated U-factor within 0.6 W/m<sup>2</sup>-K (0.1 Btu/h.ft<sup>2</sup>.deg F) or 20% of the lowest simulated U-factor, whichever is greater.

**Baseline Simulation Date:** 01/24/2018

**Expiration Date:** Five years from the date of the oldest physical test conducted for the latest certification ratings

**Report Type:** Re-Certification (GRE-A-5)

**Revision Date:** n/a

**Product Type:** Sliding Glass Door

**Simulator:** Anis Jan

**Simulator-in-Charge:** Anis Jan

**Simulation Method:** Approved NFRC software THERM7 and WINDOW7 and NFRC WINDOW/THERM simulation manual

<b>Model/Type:</b>	DDSG
<b>Size:</b>	{2000 mm x 2000 mm} / [79" x 79"]
<b>Frame Type and Finish:</b>	Aluminum/Vinyl Composite – painted
<b>Sash Type and Finish:</b>	Vinyl w/ Reinforcement – Both Interlocks, and lock & fixed stile, (steel-galvanized sheet), stated per client
<b>IG Glass Parameters:</b>	Glass from PPG. 3mm glass with 1/2" gap. Low-e coating glass from PPG: SB90/e=0.023, SB70/e=0.018 applied on srf# 2.
<b>Glazing Method:</b>	Glass is drop glazed onto foam tape from exterior with PVC glazing bead applied full perimeter from exterior.
<b>Gas Fill Method:</b>	Argon 90% & Air 10% gas fill using Evacuated chamber fill technique.
<b>Spacers:</b>	A8-D = supersure seal spacer II, dual sealed with hot melt butyl (with rigid pvc strip, both flat and corrugated strips) stated per client, and  A8-D = supersure seal spacer regular, dual sealed with hot melt butyl (with rigid pvc strip for flat strip and corrugated aluminum-mill finish for bottom strip) stated per client
<b>Dividers:</b>	Aluminum painted exterior, unpainted interior  Rectangular grid: 0.188" x 0.625" x 0.02" (<1", 0.75" grid size), and Contour grid: 0.313" x 0.984" x 0.02" (<1", 0.75" grid size).  Grid pattern: NFRC Standard  6 horizontal x 3 vertical strips/panel
<b>Grouping:</b>	
<b>Center-of-Glazing:</b>	No
<b>Frame:</b>	No
<b>Spacer:</b>	No
<b>Divider:</b>	No
<b>Miscellaneous:</b>	
<b>SHGC and VT:</b>	Default Frame Absorptivity 0.3, per ANSI/NFRC 200-2017 Sec. 4.5.D.

Glazing Matrix

<b>Glz ID</b>	<b>Name</b>	<b>Group</b>	<b>UCOG</b>	<b>Thick. (inch)</b>	<b>ID1</b>	<b>Gap fill %</b>	<b>ID2</b>
1	CLEAR / AIR / CLEAR_(DS-DS)	L1	0.481	0.736	5009	AIR	5009
2	SB90 / AIR / CLEAR_(DS-DS)	L2	0.29	0.736	5444	AIR	5009
3	SB70 / AIR / CLEAR_(DS-DS)	L3	0.288	0.736	5432	AIR	5009
4	CLEAR / ARG90% / CLEAR_(DS-DS)	L4	0.455	0.736	5009	ARG(90)	5009
5	SB90 / ARG90% / CLEAR_(DS-DS)	L5	0.243	0.736	5444	ARG(90)	5009
6	SB70 / ARG90% / CLEAR_(DS-DS)	L6	0.24	0.736	5432	ARG(90)	5009

Note: L denotes the group leader per ANSI/NFRC 100-2017.

SHGC 0 and 1 & VT 0 and 1

	No-divider	Divider < 25.4 mm	Divider >= 25.4 mm
SHGC0	0.010175	0.013409	0.016428
SHGC1	0.799769	0.704677	0.615903
VT0	0	0	0
VT1	0.789594	0.691269	0.599475

**$SHGC = SHGC0 + SHGCc * (SHGC1 - SHGC0)$**

**$VT = VT0 + VTc * (VT1 - VT0)$**

*SHGCc = center of glass SHGC value only*

*VTc = center of glass VT value only*

Series#: S-6800/6850  
 Product: PVC Sliding Glass Door

### Total Window U-Factor, SHGC & VT Values

Report: SIM18D-006  
 Report Date: 01/24/2018

										<b>Sim Lab Code:</b>		SFSE	
		<b>Operator Type:</b>		DDSG	<b>2014 Model Size:</b>		2000 mm x 2000 mm		<b>Sim Report#:</b>		SIM18D-006		
<b>Mfr Name:</b>		Green World Windows		<b>Frame Type:</b>		AV		<b>Residential Size:</b>		<b>Sim Rpt date:</b>		1/24/2018	
<b>Series/Model#:</b>		S-6800/6850 multi slide		<b>Sash Type:</b>		VV		<b>Non Res Size:</b>		<b>Sim Rpt revision date:</b>			
										<b>Thermal Break Type:</b>		N	
										<b>Frame Absorptance:</b>		0.3	
										<b>Rating Procedure:</b>		2014	

Mfr Prod. Code	Product Num	Pane Thick. 1	Pane Thick. 2	Pane Thick. 3	Gap 1	Gap 2	Emiss 1	Emiss 2	Emiss 3	Emiss 4	Emiss 5	Emiss 6	Spacer Type	Grid	Grid Size	U factor cog	SHGC cog	VT cog	Total U-factor	Total SHGC	Total VT	Total CR
CLEAR / AIR / CLEAR_(DS-DS)-supersure seal spacer-II	001	0.118	0.118		0.500								A8-D	N		0.48	0.756099	0.813306	<b>0.54</b>	0.61	0.64	39
CLEAR / AIR / CLEAR_(DS-DS)-supersure seal spacer-II - rectangular grid	001-0001	0.118	0.118		0.500								A8-D	G	0.75	0.48	0.756099	0.813306		0.54	0.56	
CLEAR / AIR / CLEAR_(DS-DS)-supersure seal spacer-II - contour grid	002	0.118	0.118		0.500								A8-D	G	0.75	0.48	0.756099	0.813306	<b>0.55</b>	0.54	0.56	39
SB90 / AIR / CLEAR_(DS-DS)-supersure seal spacer-II	003	0.118	0.118		0.500			0.023					A8-D	N		0.29	0.231486	0.524806	<b>0.39</b>	0.19	0.41	40
SB90 / AIR / CLEAR_(DS-DS)-supersure seal spacer-II - rectangular grid	003-0001	0.118	0.118		0.500			0.023					A8-D	G	0.75	0.29	0.231486	0.524806		0.17	0.36	
SB90 / AIR / CLEAR_(DS-DS)-supersure seal spacer-II - contour grid	004	0.118	0.118		0.500			0.023					A8-D	G	0.75	0.29	0.231486	0.524806	<b>0.41</b>	0.17	0.36	40
SB70 / AIR / CLEAR_(DS-DS)-supersure seal spacer-II	005	0.118	0.118		0.500			0.018					A8-D	N		0.29	0.277053	0.641005	<b>0.39</b>	0.23	0.51	40
SB70 / AIR / CLEAR_(DS-DS)-supersure seal spacer-II - rectangular grid	005-0001	0.118	0.118		0.500			0.018					A8-D	G	0.75	0.29	0.277053	0.641005		0.20	0.44	
SB70 / AIR / CLEAR_(DS-DS)-supersure seal spacer-II - contour grid	006	0.118	0.118		0.500			0.018					A8-D	G	0.75	0.29	0.277053	0.641005	<b>0.41</b>	0.20	0.44	40
CLEAR / ARG90% / CLEAR_(DS-DS)-supersure seal spacer-II	007	0.118	0.118		0.500								A8-D	N		0.46	0.756646	0.813306	<b>0.52</b>	0.61	0.64	39
CLEAR / ARG90% / CLEAR_(DS-DS)-supersure seal spacer-II - rectangular grid	007-0001	0.118	0.118		0.500								A8-D	G	0.75	0.46	0.756646	0.813306		0.54	0.56	
CLEAR / ARG90% / CLEAR_(DS-DS)-supersure seal spacer-II - contour grid	008	0.118	0.118		0.500								A8-D	G	0.75	0.46	0.756646	0.813306	<b>0.52</b>	0.54	0.56	39
SB90 / ARG90% / CLEAR_(DS-DS)-supersure seal spacer-II	009	0.118	0.118		0.500			0.023					A8-D	N		0.24	0.226010	0.524806	<b>0.36</b>	0.19	0.41	40
SB90 / ARG90% / CLEAR_(DS-DS)-supersure seal spacer-II - rectangular grid	009-0001	0.118	0.118		0.500			0.023					A8-D	G	0.75	0.24	0.226010	0.524806		0.17	0.36	
SB90 / ARG90% / CLEAR_(DS-DS)-supersure seal spacer-II - contour grid	010	0.118	0.118		0.500			0.023					A8-D	G	0.75	0.24	0.226010	0.524806	<b>0.37</b>	0.17	0.36	40
SB70 / ARG90% / CLEAR_(DS-DS)-supersure seal spacer-II	011	0.118	0.118		0.500			0.018					A8-D	N		0.24	0.272124	0.641005	<b>0.35</b>	0.23	0.51	40
SB70 / ARG90% / CLEAR_(DS-DS)-supersure seal spacer-II - rectangular grid	011-0001	0.118	0.118		0.500			0.018					A8-D	G	0.75	0.24	0.272124	0.641005		0.20	0.44	
SB70 / ARG90% / CLEAR_(DS-DS)-supersure seal spacer-II - contour grid	012	0.118	0.118		0.500			0.018					A8-D	G	0.75	0.24	0.272124	0.641005	<b>0.37</b>	0.20	0.44	40
CLEAR / AIR / CLEAR_(DS-DS)-supersure seal spacer_regular	013	0.118	0.118		0.500								A8-D	N		0.48	0.756099	0.813306	<b>0.54</b>	0.61	0.64	38
CLEAR / AIR / CLEAR_(DS-DS)-supersure seal spacer_regular - rectangular grid	013-0001	0.118	0.118		0.500								A8-D	G	0.75	0.48	0.756099	0.813306		0.54	0.56	

Series#: S-6800/6850

### Total Window U-Factor, SHGC & VT Values

Report: SIM18D-006

Product: PVC Sliding Glass Door

Report Date: 01/24/2018

Mfr Prod. Code	Product Num	Pane Thick. 1	Pane Thick. 2	Pane Thick. 3	Gap 1	Gap 2	Emiss 1	Emiss 2	Emiss 3	Emiss 4	Emiss 5	Emiss 6	Spacer Type	Grid	Grid Size	U factor cog	SHGC cog	VT cog	Total U-factor	Total SHGC	Total VT	Total CR
CLEAR / AIR / CLEAR_(DS-DS)-supersure seal spacer_regular - contour grid	014	0.118	0.118		0.500								A8-D	G	0.75	0.48	0.756099	0.813306	<b>0.55</b>	0.54	0.56	38
SB90 / AIR / CLEAR_(DS-DS)-supersure seal spacer_regular	015	0.118	0.118		0.500			0.023					A8-D	N		0.29	0.231486	0.524806	<b>0.40</b>	0.19	0.41	39
SB90 / AIR / CLEAR_(DS-DS)-supersure seal spacer_regular - rectangular grid	015-0001	0.118	0.118		0.500			0.023					A8-D	G	0.75	0.29	0.231486	0.524806		0.17	0.36	
SB90 / AIR / CLEAR_(DS-DS)-supersure seal spacer_regular - contour grid	016	0.118	0.118		0.500			0.023					A8-D	G	0.75	0.29	0.231486	0.524806	<b>0.42</b>	0.17	0.36	39

**Total Window U-Factor, SHGC & VT Values**

Mfr Prod. Code	Product Num	Pane Thick. 1	Pane Thick. 2	Pane Thick. 3	Gap 1	Gap 2	Emiss 1	Emiss 2	Emiss 3	Emiss 4	Emiss 5	Emiss 6	Spacer Type	Grid	Grid Size	U factor cog	SHGC cog	VT cog	Total U-factor	Total SHGC	Total VT	Total CR
SB70 / AIR / CLEAR_(DS-DS)-supersure seal spacer_regular	017	0.118	0.118		0.500			0.018					A8-D	N		0.29	0.277053	0.641005	<b>0.40</b>	0.23	0.51	39
SB70 / AIR / CLEAR_(DS-DS)-supersure seal spacer_regular – rectangular grid	017-0001	0.118	0.118		0.500			0.018					A8-D	G	0.75	0.29	0.277053	0.641005		0.20	0.44	
SB70 / AIR / CLEAR_(DS-DS)-supersure seal spacer_regular - contour grid	018	0.118	0.118		0.500			0.018					A8-D	G	0.75	0.29	0.277053	0.641005	<b>0.42</b>	0.20	0.44	39
CLEAR / ARG90% / CLEAR_(DS-DS)-supersure seal spacer_regular	019	0.118	0.118		0.500								A8-D	N		0.46	0.756646	0.813306	<b>0.52</b>	0.61	0.64	38
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SB90 / ARG90% / CLEAR_(DS-DS)-supersure seal spacer_regular - contour grid	022	0.118	0.118		0.500			0.023					A8-D	G	0.75	0.24	0.226010	0.524806	<b>0.38</b>	0.17	0.36	39
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SB70 / ARG90% / CLEAR_(DS-DS)-supersure seal spacer_regular – rectangular grid	023-0001	0.118	0.118		0.500			0.018					A8-D	G	0.75	0.24	0.272124	0.641005		0.20	0.44	
SB70 / ARG90% / CLEAR_(DS-DS)-supersure seal spacer_regular - contour grid	024	0.118	0.118		0.500			0.018					A8-D	G	0.75	0.24	0.272124	0.641005	<b>0.38</b>	0.20	0.44	39

A8-D = exposed corrugated aluminum spacer with butyl- dual sealed  
 Product# 001 to 012 with supersure seal spacer II (see page 2 for more detail)  
 Product# 013 to 024 with supersure seal spacer regular (see page 2 for more detail)

SUMMARY AND ASSUMPTIONS:

1. For glass info., refer to Glazing Matrix detail this report.
2. This aluminum/vinyl composite sliding glass door, consists of 7 frame cross-sections. Frame members were aluminum (painted), with PVC snap-on interior piece. Sash is rigid PVC. All vertical members were reinforced with galvanized sheet reinforcement bars.  
Frame weather-strip: fin-seal (mohair) full perimeter facing exterior & interior.  
Sash weather-strip: none, (foam tape facing interior)  
Both interlocks have mohair, facing exterior and interior.
3. The Condensation Resistance results obtained from this procedure are for controlled laboratory conditions and do not include the effects of air movement through the specimen, solar radiation, and the thermal bridging that may occur due to the specific design and construction of the fenestration system opening.
4. As per ANSI/NFRC 200-2017: For SHGC & VT, actual glazing infill pane thicknesses in Table 4-1 for the range of glazing infill pane thicknesses were used.
5. For SHGC ratings, the values are calculated for the best glazing option model with the highest frame and edge U-factor frame per ANSI/NFRC 200-2017. The values calculated from that one case are then used to calculate the SHGC & VT for any other glazing options using Equations 4-1 and 4-2 in ANSI/NFRC 200-2017.
6. Drawings will be sent as a separate package and that the product simulated confirms to drawings supplied by manufacturer.

### **WINDOW SIMULATION REPORT:**

The fenestration products documented in this report were simulated in accordance with the ANSI/NFRC 100-2017: Procedure for Determining Fenestration Product Thermal Performance & NFRC 500-2017. The fenestration products were simulated using computer programs Therm 7.4.4, Window 7.4.14 & Spectral Data # 59.0 as specified in ANSI/NFRC 100-2017 and ANSI/NFRC 200-2017 (SHGC/VT). The WINDOW program models the one-dimensional heat flow through the center-of-glass portion of the window. The Therm program models the two-dimensional heat flow through the frame, edge-of-glass, divider, and divider-edge portions of the fenestration product. The input data for both programs is based on manufacturer's specifications. Defaults for material thermal and optical properties are given in the computer programs. When values other than defaults were used, they are documented.

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It is the policy for this laboratory to verify as much information about the product being tested and simulated. However, not all information provided to the laboratory can be verified, such as physical properties of low-e coating, heat mirror, gas fills spacer, and others. Therefore, all information provided to the laboratory is the manufacturer's responsibility as to its accuracy.

It is the policy of this laboratory to prepare a report and submit it to the manufacturer for his approval. Upon notification in writing from the manufacturer that he approves of the report, (in approving report, manufacturer takes responsibility of all information provided to this laboratory) the report is sent to the certification agency. The data shall be kept for a period of five years after which they may be destroyed.

Fenestration Simulation Engineering will not be responsible for inaccuracies in the information it has been provided.

- A. Simulations were conducted in full compliance with NFRC requirements.
- B. This report shall not be reproduced, except in full, without the approval of this laboratory.
- C. This report relates only to the fenestration products simulated.
- D. Rounding is per NFRC 601, NFRC Unit and Measurement Policy.
- E. Ratings values included in this report are for submittals to an NFRC-licensed IA and are not meant to be used directly for labeling purposes. Only those values identified on a valid Certification Authorization Report (CAR) by an NFRC Accredited Inspection Agency (IA) are to be used for labeling purposes.**
- F. Name and signature of the individual performing the simulations and accepting the responsibility for the technical accuracy of this simulation report.

*Anis Jan*

*Anis Jan*

*Simulator-in-responsible-charge*